



Standard Practice for Sampling of Headspace Vapors from Fire Debris Samples¹

This standard is issued under the fixed designation E 1388; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice describes the procedure for removing small quantities of flammable or combustible liquid residue from samples of fire debris by sampling the headspace of the debris container.

1.2 Separation and concentration procedures are listed in the referenced documents.

1.3 *This standard does not purport to address the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 1386 Practice for Separation and Concentration of Flammable or Combustible Liquid Residues from Fire Debris Samples by Solvent Extraction²

E 1387 Test Method for Flammable or Combustible Liquid Residues in Extracts from Samples of Fire Debris by Gas Chromatography²

3. Summary of Practice

3.1 The sample, preferably in its original container, is heated in order to volatilize any petroleum products present in the debris. After heating, the headspace is sampled and analyzed by gas chromatography.

4. Significance and Use

4.1 This practice is useful for screening samples for the presence of a particular type of petroleum product.

4.2 This practice is useful when volatile oxygenated products such as alcohols or lacquer thinners are suspected.

4.3 This practice is the least sensitive of the sample preparation techniques and may not detect quantities of less than 10 μ L of petroleum product.

4.4 Due to variables in the debris sample condition prior to headspace sampling, complete reproducibility of chro-

matograms may be difficult to obtain.

4.4.1 To obtain greater reproducibility, use one of the separation procedures which results in a solution of the flammable or combustible liquid residue, such as Practice E 1386.

5. Apparatus

5.1 *Heating system*—An oven or a heating mantle to fit the evidence container, or a hot plate.

5.2 *Temperature measuring device*—A thermometer or thermocouple capable of measuring temperatures in the range of 40 to 150°C.

5.3 A syringe capable of introducing sample sizes in the range of 0.5 to 5 mL.

5.4 A drill or punch, to puncture holes in container lids.

6. Sample Preparation

6.1 Observe the appropriate procedures for handling and documentation of all submitted samples.

6.1.1 Open and examine the fire debris sample in order to determine that it is consistent with its description.

6.1.1.1 Resolve any discrepancies between the submitting agent's description of the evidence and the analyst's observation with the submitting agent prior to the completion of the report.

6.2 Punch or drill a small hole in the container lid and cover the hole with tape.

6.3 Place the temperature measuring device in the lid of the container.

6.4 Place the container in the heating system for 20 to 60 min until the temperature inside the container reaches 90°C.

7. Sampling Procedure

7.1 Remove the container from the heating apparatus, push the syringe through the tape into the hole in the container lid. Slowly pump the syringe three times, withdraw from the lid, and inject 0.5 to 2.0 mL of sample into the gas chromatograph. Analyze as described in Test Method E 1387.

7.1.1 The optimum sample size will vary with chromatograph column and conditions.

7.2 After the headspace sample has been removed, reseal the hole with tape.

¹ This practice is under the jurisdiction of ASTM Committee E-30 on Forensic Sciences and is the direct responsibility of Subcommittee E30.01 on Criminalistics. Current edition approved Oct. 26, 1990. Published December 1990.

² *Annual Book of ASTM Standards*, Vol 13.01.

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 1916 Race St., Philadelphia, PA 19103.